Interesting Case for the ASPN Newsletter

This case consists of a 49 year-old male who presented to an outside institution with a T3, N0, M0 squamous cell carcinoma of the right parotid gland. His past medical history is significant for hyperthyroidism and hydrocephalus with placement of a VP shunt in 2003. In June 2013, he underwent a right superficial parotidectomy at the outside institution. The pathology report noted a primary squamous cell carcinoma of the parotid gland with positive margins. On 07/19/13 he underwent a right total parotidectomy, right neck dissection with resection of the upper division of cranial nerve VII, sparing of the lower division and upper lid, gold weight insertion by an ENT. The second pathology report also noted a positive margin at the zygomatic arch so on 10/17/13, the patient completed concurrent cisplatin chemotherapy for the above-noted positive margin. Several days later on 10/24/13, he completed external beam radiation with a total dose of 6600 cGy.

In early 2014, the patient presented to his initial treating physician with an SCC recurrence on the overlying parotid skin. On 02/27/14 he had a repeat marginal skin excision with a subsequent pathology report that demonstrated squamous cell carcinoma less than 0.1 mm from the deep margin. On 04/03/14 he had a repeat marginal skin excision, condylectomy, 2 cm zygomatic arch excision and excision of the nerve to the masseter with placement of arch bars and heavy elastics. The pathology report from this last operation demonstrated that all margins were negative for squamous cell carcinoma. On 04/09/2014, the patient underwent a radial forearm free flap or soft tissue reconstruction. He subsequently first presented to his new surgeon on 08/11/2014 for options regarding possible facial reanimation. His images are noted below.

The following surgical options were discussed:

1) A static procedures for the forehead and lower eyelid

2) A two-stage reconstruction involving: 1.Cross facial nerve grafting, 2.Partial gracilis functional muscle transplantation

3) A single-stage procedure involving a partial gracilis, functional muscle transplant coapted to the masseter nerve if the proximal nerve stump could be found - recommended

Break 1:

Would you suggest any other possible treatment options at this point? Are there any other diagnostic studies or imaging studies that you might suggest at this time point that would skew your opinion for one surgical procedure over another?

Dr. Coombs - With regard to other treatment options, I would suggest the following possibilities:

- Endoscopic browlift, unilateral
- After checking eye irritation history, eye closure and Bell's phenomenon, replace his gold weight to a lighter weight to improve eyelid ptosis

- Static sling to right commissure taken to the midline to improve position – I typically use the palmaris longus fixed at the commissure and midline to prevent elongation of the upper and lower lips
- I assess masseter function, as from images, the patient seems to still have fullness over the mandibular angle and I would expect him to have more wasting than he appears to have. If this is functioning then I would suggest a single stage gracilis onto the nerve to the masseter with the above procedures
- If there is no masseter function remaining and the nerve has been divided it is difficult to find in the scarred bed. I have gone back to find this previously and I would not spend a lot of time on it as there are other good options available. Therefore, I would prepare the patient for other nerve transfers to motor the gracilis either using XI or an end to side onto XII with division of the XII to the posterior tongue. At the same procedure I would also do a meloplasty utilizing the pre-masseteric space to address the droop and jowl on the right.
- The temporalis I believe should not be used as it is a stabilizer of the mandible on that side.

Dr. Coombs - With regard to any other diagnostic studies or imaging studies that one might suggest at this time:

- I would ensure that he is disease free with respect to his tumor and
- I would do a CTA to assess the recipient vessels.

Dr. Klebuc -

Pre-Operative Evaluation:

1. Prior to moving forward with the reconstruction I would like to obtain an MRI and full examination to verify that there is no recurrence of the SSC. I would also request an MRA or CT angiogram to assess potential targets for microvascular anastomosis and to determine if an A-V loop may be required during the reconstruction.

2. Examine for contraction of the temporalis muscle, masseter muscle and orbicular oris. Determine if the coronoid has been resected along with the condyle rendering the temporal is muscle non-functional.

Surgical Plan:

Stage I

1. Right anterior hairline, subcutaneous brow lift.

2. Exchange the weight for a lighter gold weight anchored to the cephalic border of the tarsus to better conceal the device and improve the cosmetic result.

3. Palmaris longus mini tendon graft for lower eye lid support.

4. Exploration of contralateral facial nerve with selective transection of a large zygomatic branch producing activation of the zygomaticus major within the substance of the parotid gland. I would selectively transect the largest branch producing an active smile.

5. Cross-face sural nerve graft through the upper lip with end-to-side coaptation of a V_2 sensory branch to the distal portion of the nerve graft in an effort to prevent Schwann cell senescence.

Stage II

1. A-V loop if required.

2. Segmental free gracilis muscle flap.

3. Burr down the zygoma to prevent excess flap bulk in the cheek region and partial excision of the buccal fat pad.

4. Gracilis tendon graft for static suspension of the mid-face and perioral region fixed to the zygoma with screw-less suture anchors.

Additional Thoughts - If the coronoid was resected and the temporalis muscle is contractile, it could be utilized along with fascia lata grafts (MacLaughlin transfer) to provide a potential back up plan. However, the history of radiation in this region makes it a less attractive option.

On 08/29/2014 the patient had a right brow lift and repair of a right lower lid ectropion with a tarsal strip. On 09/09/2014 he underwent attempted exploration for the nerve to the right masseter which was unsuccessful. A concurrent exploration of the contralateral facial nerve revealed diminutive buccal and zygomatic branches.

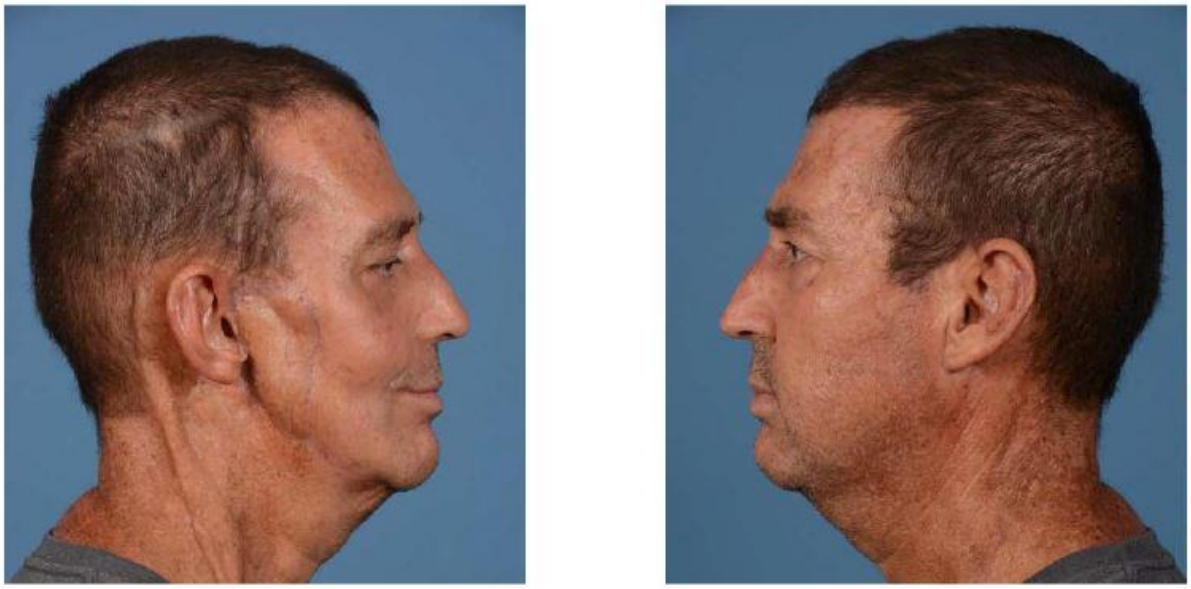
Break 2: What would you do at this point in the OR?

Dr. Coombs - Ideally I wouldn't be in this situation as I was going to use either XI or XII as my donor if V was unavailable. In this age group I don't use the contralateral facial nerve as in the older population nerve regeneration is less reliable whereas an ipsilateral nerve transfer will re-innervate a free functioning muscle well.

Dr. Klebuc - I would explore the masseter nerve on the unaffected left side and connect it to a cross face nerve graft. This nerve would be used to power a free muscle flap in 10-12 months.

At this point, the case was converted to TFL static slings. On 12/29/2015 the patient had another operation involving a functional, partial gracilis with nerve coaptation to the right intra-temporal proximal facial nerve stump following confirmation of a cancer-free nerve margin. On 04/19/16 the patient had an exchange of his gold weight from the pre-tarsal to the post-septal position. The final set of photographs depict frontal and lateral views of the patient in repose and with attempted smile 22 months after static TFL slings (09/2014) and 7 months status-post functional, gracilis-to-proximal, intra-temporal facial nerve muscle transplantation (12/2015). Unfortunately, no facial motion is observed.

07.13.2016
{22 months after Static TFL slings - 9.9.2014}
{7 months post gracilis to proximal intratemporal CN VII (No motion observed)}



Break 3:

What would you tell the patient given these results at this time?

Dr. Coombs - It is only 7 months from his last operation and there is still a chance that motion has not yet commenced as the nerve may just be getting to the muscle so I would try to elicit a Tinel sign to follow it. I would also let him know, as I would have preoperatively, with his age and the previous radiotherapy there is a chance that he will not regain motion. So currently, he needs to be patient and see what happens over the next 6 months. I would check to see if he has any improvement in preoperative symptoms such as drooling, biting his cheek, improved speech and highlight the improvement in these parameters, which there should be, and also show him the change in facial asymmetry which is also markedly improved.

This type of patient presents a difficult management paradigm and the initial consultations need to set the stage for patient expectations so that they understand and they have a perspective that is appropriate. Creating facial symmetry both statically and dynamically is never possible in this type of patient and the patient needs to understand this concept from the outset. After they have had a positive oncological result, their expectations change and this needs to be managed from the outset.

The use of nerve transfers for motoring a free muscle transfer has been shown to be an effective way of obtaining motion. This concept has been shown with the nerve to masseter and the XI cranial nerve. The XII nerve used with end to side coaptation and division of the motor fascicles to the posterior 1/3 of the tongue (which will maintain normal tongue motion) are all excellent choices for a single stage procedure for facial reanimation with free muscle transfer in the older age group. The issue is spontaneity as we all know, but again transfers are more reliable to create motion than a cross-facial nerve graft. The use of the ipsilateral facial nerve in this case also presents challenges with unreliable re-innervation because of the length of time it has been severed and also it would have received 6600cGy of XRT. For these reasons, I prefer to import a new nerve source in the form of a transfer and in this case I would have probably used the XI cranial nerve as the donor for the gracilis transfer.

Dr. Klebuc - I would ask him to be patient and wait as the nerve has to traverse a significant distance and there may not be any movement for another 4-5 months. I would be concerned about synkinetic motion of the muscle if the obturator nerve was coapted to the main trunk of the facial nerve.